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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,329	06/12/2001	Ethan R. Signer	408445	4053
23557	7590	12/15/2006	EXAMINER	
SALIWANCHIK LLOYD & SALIWANCHIK A PROFESSIONAL ASSOCIATION PO BOX 142950 GAINESVILLE, FL 32614-2950			SULLIVAN, DANIEL M	
			ART UNIT	PAPER NUMBER
			1636	

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/879,329

Applicant(s)

SIGNER ET AL.

Examiner

Daniel M. Sullivan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8,9 and 19-21 is/are allowed.
- 6) ☒ Claim(s) 1,4,6,10,12,14,15 and 18 is/are rejected.
- 7) ☒ Claim(s) 2,3,5,7, 11, 13 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

This Office Action is a response to the Paper filed 11 October 2006 in response to the Non-Final Office Action mailed 11 July 2006. Claims 1-16 and 18-21 were considered in the 11 July Office Action. Claims 1, 2, 4 and 18 were amended in the 11 October Paper. Claims 1-16 and 18-21 are pending and under consideration.

#### *Response to Amendment and Arguments*

##### Claim Rejections - 35 USC § 103

Claims 1, 4, 6, 10, 12, 14, 15 and 18 **stand rejected** under 35 U.S.C. 103(a) as being unpatentable over Bauer *et al.* and further in view of Ow, D. (WO 93/01283) for reasons of record and herein below in the response to Applicant arguments.

As described in the 1 April 2004 Office Action, Bauer *et al.* teaches a genetic construct comprising a positive selectable marker gene and a negative selectable marker gene, different in kind from the positive selectable marker, and direct repeats of a gene of interest that flank the positive and negative selectable marker genes (see especially the paragraph beginning at line 34 in column 3 and the paragraph bridging columns 3-4). With regard to the limitation of the substrate as "complementary to" the selectable marker, Applicant indicates that this relationship is described in paragraph 30 of the specification. Based on the description therein, the limitation is understood to encompass any medium or growth condition that provides for selection by the marker gene. In columns 8-10, Bauer *et al.* contemplates a variety of positive and negative selectable marker genes and media or growth conditions that provide for selection (*e.g.*, inducers

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of promoters operably linked to nucleic acids encoding toxic gene products for use as negative selectable markers).

Furthermore, in the paragraph bridging columns 10-11, Bauer *et al.* teaches a method of removing a selectable marker comprising transforming cells with the genetic construct disclosed therein, identifying transformants using the integration marker (*i.e.*, positive selection marker) and then selecting cells that have lost the negative selection marker by culturing in negative selection medium. Thus, Bauer *et al.* teaches a genetic construct having all of the limitations of the genetic construct system of the instant claim 1 and a method having all of the limitations of claim 4 except that Bauer *et al.* does not teach the construct system applied to plants.

Ow teaches a method of producing marker-free transgenic plants wherein a selectable marker gene is flanked by site specific recombination sites and excised using a site specific recombinase (see especially the discussion beginning the first full paragraph on page 6 and continued through the first full paragraph on page 7).

It would have been obvious to one of ordinary skill in the art to substitute the method of Bauer *et al.*, using a construct comprising a positive and negative selectable marker flanked by direct repeats according to the instant claims, for the method of Ow, which utilizes a selectable marker flanked by site specific recombination signals to remove selectable marker genes from plant cells. One would be motivated to modify the teachings of Ow in this way in view of the teaching of Bauer *et al.* that site specific recombination systems are inferior to the method disclosed therein because the site specific recombination does not remove all of the exogenous DNA (see especially column 3, lines 26-28).

Absent evidence to the contrary, one would have a reasonable expectation of success in practicing the method of Bauer *et al.* in plant cells because one of ordinary skill would expect that the homologous recombination required for deletion of the marker genes would operate in plant cells as well as yeast.

In view of these considerations, the instant claims 1 and 4, as a whole, would have been obvious to one of ordinary skill in the art at the time the invention was made, as would the method of claim 17, which merely recites that the eukaryotic cell is a plant cell.

Finally, claim 18, which limits the cell of claim 17 to one of a variety of species, would also be obvious to one of ordinary skill in the art because Ow teaches that excision of marker genes is generally desirable in any transgenic plant (see especially the third paragraph on page 4) and explicitly contemplates production of marker-free tobacco (see especially Example 2).

For these reasons, the invention of claims 1, 4, 17 and 18 as a whole would be obvious to one of ordinary skill in the art at the time of filing.

With regard to claims 6, 10, 12, 14 and 15, the claims are directed to the genetic construct of claim 1, wherein the positive and negative selectable markers are limited to specific arrangement within the construct with respect to one another (*e.g.*, GI-PS-NS-GI *versus* GI-NS-PS-GI). Claims 14 and 15 are further limited to comprising additional genes of interest flanking the gene of interest present as a direct repeat. As originally discussed in the 1 April Office Action (page 5), although Bauer *et al.* does not explicitly teach any particular configuration of the positive and negative selectable markers, other than that they should be flanked by the direct repeat, the skilled artisan would not expect that the arrangement of the selectable markers within the boundaries of the direct repeat would affect the function of the construct in any way.

A *prima facie* case of obviousness may be made when chemical compounds have very close structural similarities and similar utilities because one skilled in the art would be motivated by the expectation that compounds of similar structure will have similar function (see *e.g.*, MPEP 2144.09). Thus, it would be *prima facie* obvious to the skilled artisan to use either of the configurations of positive and negative selectable markers set forth in the claims. With regard to additional genes of interest, Bauer *et al.* teaches that the constructs might comprise one or several additional genes of interest located outside of the direct repeat sequence (see especially column 4, lines 11-14).

Given these teachings, the invention of claims 6, 10, 12, 14 and 15, as a whole, would also have been obvious to one of ordinary skill in the art at the time the invention was made.

#### *Response to Arguments*

In response to the *prima facie* rejection and arguments of record, Applicant has amended the claims such that they now require that the gene of interest include a nucleic acid sequence encoding a protein. Applicant contends that the difference between the present invention and Bauer is that Bauer requires that the direct repeat sequences are noncoding. Applicant admits that Bauer indicates that it is possible to use a fragment of a gene as a DRS but contends that this teaching does not render obvious what is claimed because Bauer teaches that efforts should be made to prevent the gene fragment from being translated into the form of a peptide.

Applicant urges that, because a gene is a functional unit of heredity and the direct repeats of the instant claims contain a gene of interest, it follows that the direct repeats of the instant claims contain at least one encoding sequence that encodes a protein.

This argument has been fully considered but is not deemed persuasive. The argument appears to be based on the assumption that the direct repeats of the instant claims are limited to comprising a coding sequence for a full length protein encoding gene and require that the construct is configured such that a protein is expressed from the direct repeats. However, the claims require only that the genetic construct comprise “two direct repeats of a gene of interest”. The broadest reasonable interpretation of this limitation is that the construct comprises direct repeats obtained from a gene of interest. There is no limitation in the claims requiring that the entire coding sequence of the gene of interest be comprised by the construct or that the construct be configured such that the gene of interest is expressed. The claims require only that two direct repeats be “of”—i.e., derived from<sup>1</sup>—a gene of interest.

As Applicant acknowledges in the remarks, Bauer teaches that it is possible to use a fragment of a gene as a direct repeat sequence. (Page 8, first full paragraph, of the 11 October Paper.) In fact, Bauer teaches that the DRS can contain portions of protein encoding genes. (Column 7, first full paragraph.) Therefore, Bauer does teach that, in one embodiment, the DRS might be of a gene of interest that encodes a protein, which embodiment renders obvious the genetic construct of the instant claims for the reasons of record regarding the teachings of Bauer in view of Ow.

Applicant’s arguments have been fully considered but are not deemed persuasive in view of the record as a whole. Therefore, the claims stand rejected under 35 U.S.C. §103 as obvious

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<sup>1</sup> See Merriam-Webster’s Online Dictionary, “of” definition 2a, “used as a function word to indicate origin or derivation”.

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over the art.

Claim Rejections - 35 USC § 112

Rejection of claims 1-7, 10-16 and 18 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement is **withdrawn** in view of the amendment of the claims to remove the new matter therefrom.

Rejection of claim 18 under 35 U.S.C. 112, second paragraph, as being indefinite is **withdrawn** in view of the amendment of the claim to depend from claim 17.

*Allowable Subject Matter*

Claims 8, 9 and 19-21 are allowed.

Claims 2, 3, 5, 7, 11, 13 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period



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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel M. Sullivan whose telephone number is 571-272-0779. The examiner can normally be reached on Monday through Friday 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Remy Yucel, Ph.D. can be reached on 571-272-0781. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

  
Daniel M. Sullivan, Ph.D.  
Primary Examiner  
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